

## Fabrication of photonic crystals in InP by $\text{Cl}_2$ -based inductively coupled plasma etching using sidewall passivation

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Deep etching of two-dimensional photonic crystals in InP-based planar waveguides has been performed by state-of-the-art techniques as chemically assisted ion beam etching (CAIBE) [1] and inductively coupled plasma (ICP) etching [2], the latter being more suitable for large scale production. We present new sidewall passivation processes in  $\text{Cl}_2$ -based ICP-etching to obtain holes with straight and vertical sidewalls. With this technique we are able to etch holes with a diameter of  $\sim 240$  nm down to a depth of  $3.4\ \mu\text{m}$ , the shape being nearly cylindrical in the upper  $2.5\ \mu\text{m}$ , see fig 1.

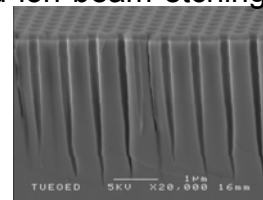


Figure 1: SEM view of the etched holes.

- [1] M.V. Kotlyar *et.al.*, *Appl. Phys. Lett.* **84**, 3588, 2004; M. Mulot *et. al.*, *J. Vac. Sci. Technol. B* **22**, 707, 2004.
- [2] F. Pommereau *et. al.*, *J. Appl. Phys.* **95**, 2242, 2004.